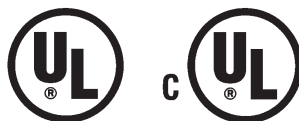


# **APC Silcon 10-80kW 208/480V Battery Cabinet Installation Guide**



**Copyright ©2001 APC USA**

Due to continuous product development information  
given in this guide is subject to change without notice.



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**IMPORTANT SAFETY INSTRUCTIONS**  
**SAVE THESE INSTRUCTIONS**

**This manual contains important instructions for your APC Silcon Battery Cabinet that should be followed during installation and maintenance of the UPS and batteries.**

- a Servicing of batteries should be performed or supervised by qualified service personnel of batteries and the required precautions. Keep unauthorized personnel away from batteries.
- b When replacing batteries, replace with the same number and type as installed.
- c **CAUTION** - Do not dispose of battery or batteries in a fire. The battery may explode.
- d **CAUTION** - Do not open or attempt to modify batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- e **CAUTION** - A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries:
  - 1. Remove watches, rings, or other metal objects.
  - 2. Use tools with insulated handles.
  - 3. Wear rubber gloves and boots.
  - 4. Do not lay tools or metal parts on top of batteries.
  - 5. Disconnect charging source prior to connecting or disconnecting battery terminals.
  - 6. Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.

The installation and use of this product must comply with all national, federal, state, municipal, or local codes that apply. If you need assistance, please, have your UPS model and serial number available and call APC's toll free technical support at: 1-877-287-7835 (1-877-2UPS-TEK).

You can find additional product information on the APC World Wide Web site at <http://www.apcc.com>. See Section 2.0: How to contact APC.



**WARNING!**

With reference to Local Code use: 1. Additional insulating material  
2. Insulating tools

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## 1.0 Battery Cabinet

### 1.1 Safety - Warnings



#### WARNINGS!

The total system contains **HAZARDOUS AC/DC VOLTAGES** and is supplied from multiple power sources. Some terminals and components are live even when the system is switched off!

**ONLY** qualified electricians are allowed to perform the installation according to national and local codes!

**NO** APC Silcon UPS is allowed to have internal batteries when connected to an external battery cabinet! (For 208V 60kW and 80kW cabinets contact APC tech-support for further instructions).

Do **NOT** install the APC Battery Cabinet (SLB) and operate the Battery Breaker switches without referring to this Installation Guide.

### 1.2 Unpacking

#### 1.2.1 Preparing the APC Silcon Battery Cabinet

Unpack the battery cabinet by removing the packaging material and placing the unit near the UPS. Open the doors and remove the dead front panel for access to the gland plate, external cables and the breaker connections.



The gland plate must be reinstalled into the base of the battery cabinet; containment issues require the use of the gland plate.

#### 1.2.2 Placing

When installing the APC Silcon Battery Cabinet to the UPS take special care not to cause a short in the battery cabinet. Transport the battery cabinet to the installation site by lifting underneath by means of a forklift.

# Battery Cabinet

If you are placing the battery cabinet near the UPS, mate the cabinet to the left side of the UPS. The cables can then run through the side of the cabinets. (For 208V 60kW and 80kW cabinets contact APC tech-support for further instructions).

## 1.3 Dimensions / Weights

### 1.3.1 APC Silcon Battery Cabinets for 10-80kW – 208V

SKU Number (Item)	Runtime [min.]		Dimensions WxDxH [in/mm]	Weight [lbs./kg]	Drawing
	15kW	20kW			
SLB15K20F1	41	28	50/1270x31.5/800x55.1/1400	1675/760	A
SLB15K20F2	67	47	50/1270x31.5/800x55.1/1400	2150/975	A
SLB15K20F3	25	78	50/1270x31.5/800x55.1/1400	2725/1236	B4
	30kW	40kW			
SLB30K40F2	27	18	50/1270x31.5/800x55.1/1400	2150/975	A
SLB30K40F3	44	33	50/1270x31.5/800x55.1/1400	2725/1236	B4
SLB30K40F5	61	44	50/1270x31.5/800x55.1/1400	3825/1735	B1
SLB30K40F6	80	60	50/1270x31.5/800x55.1/1400	4100/1860	B1
	60kW	80kW			
SLB60K80F3	16	9	50/1270x31.5/800x55.1/1400	2725/1236	B4
SLB60K80F5	25	17	50/1270x31.5/800x55.1/1400	3825/1735	B1
SLB60K80F6	36	22	50/1270x31.5/800x55.1/1400	4100/1860	B1
SLB60K80F5 + SLB10K80FXR5	59	43	100/2540x31.5/800x55.1/1400	6400/2900	B2+B2XR
SLB60K80F6 + SLB10K80FXR6	75	58	100/2540x31.5/800x55.1/1400	8100/3675	B2 + B2XR

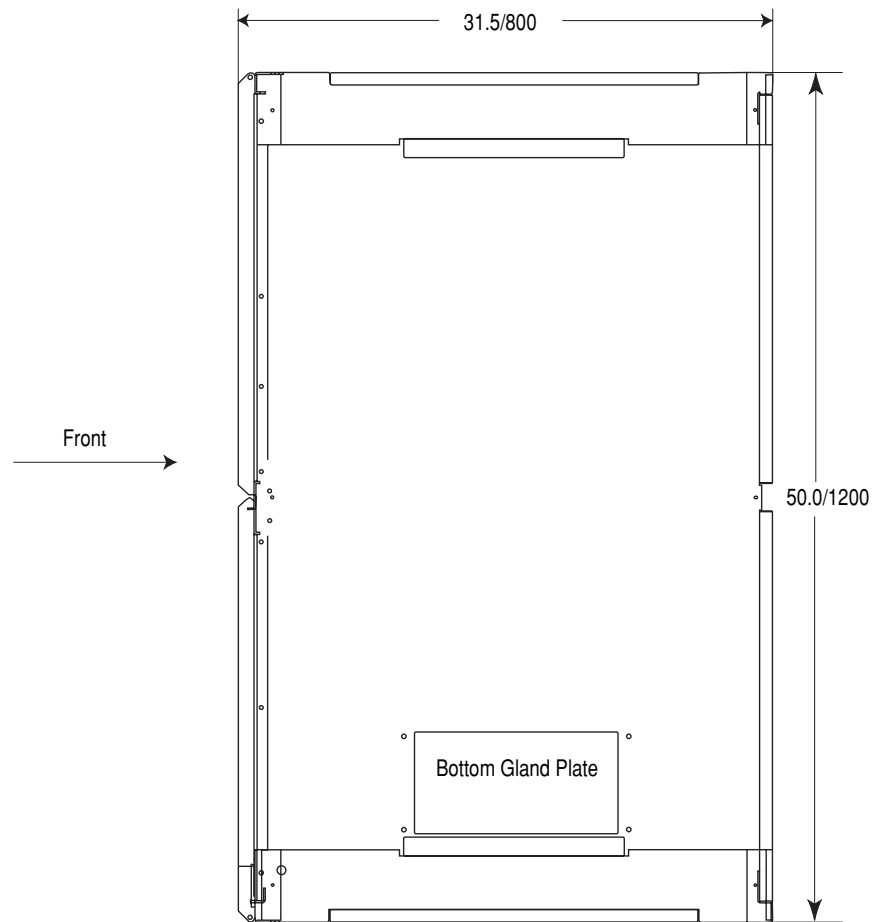
### 1.3.2 APC Silcon Battery Cabinets for 10-80kW – 480V

SKU Number (Item)	Runtime [min.]			Dimensions WxDxH [in/mm]	Weight [lbs./kg]	Drawing
	30kW	40kW	60kW			
SLB30K60G1	40	28	15	50/1270x31.5/800x55.1/1400	2200/998	C2
SLB30K60G2	60	43	26	50/1270x31.5/800x55.1/1400	3425/1554	C2
SLB30K60G3-2C	90	70	42	50/1270x31.5/800x55.1/1400	5225/2370	C3
SLB30K60G5-2C	120	90	60	50/1270x31.5/800x55.1/1400	6300/2858	B3
	80kW					
SLB80KG1	9			50/1270x31.5/800x55.1/1400	2550/1157	C2
SLB80KG2	15			50/1270x31.5/800x55.1/1400	3425/1554	C2
SLB80KG1 + SLB10K80GXR1	25			100/2540x31.5/800x55.1/1400	5075/2300	C2+C2XR
SLB10K80GXR2	45			100/2540x31.5/800x55.1/1400	6800/3100	C2+C2XR
SLB80KG5-2C	42			100/2540x31.5/800x55.1/1400	6300/2858	B3
SLB80KG6-2C	59			100/2540x31.5/800x55.1/1400	8000/3629	B3

\*Please refer to Appendix for schematics

# Battery Cabinet

## 1.4 Footprint (measurements in inch/mm)



Note: these dimensions include side covers, rear covers, and front doors

# Battery Cabinet

---

## 1.5 Configurations

### 1.5.1 Battery Cabinet installed next to UPS



Breaker cabinet with breakers

APC Silcon UPS



## 1.6 Assembly

### 1.6.1 Battery Cabinet next to UPS

Start by positioning the UPS. Remove the two cover plates on the left side of the UPS, both fixed with screws on the inside of the UPS cabinet (see photo below).



Left side view of UPS with cover plates removed (door open)

Line up the Battery Cabinet to the left side of the UPS. (For 208V 60kW and 80kW cabinets contact APC Tech-Support for further instructions).

If the battery solution consists of more than one cubicle, remove the left sidepanel in the cabinet containing the battery breakers. Line up the two cabinets, and ground the two together with the enclosed green cable and hardware. Repeat this if more cabinets have to be connected.

### 1.6.2 Connection of more than one string

This system consists of two separate cabinets shipped on separate pallets. The two cabinets are different internally. Cabinet A will contain a pair of circuit breakers while Cabinet B will not contain any circuit breakers. Please open the door (on the right) on the two cabinets to identify A and B.

Battery wiring diagrams for both Cabinet A and Cabinet B are provided in the appendix. As indicated in the diagram, some inter-cell connectors between batteries as marked will need to be connected on site.

Additionally, the 4 DC bus cables from Cabinet B will have to be connected to the appropriate connection points in Cabinet A as indicated in the diagram.

#### **NOTICE!**

The unit that you have received may have all of the inter-cell connectors on the front terminal of the front row of batteries disconnected.

# Battery Cabinet

## 1.6.3 Battery Cabinet apart from UPS

Start by positioning the Battery Cabinet containing the breakers in its approximate location. If the battery solution consists of more than one cabinet, remove the left sidepanel in the Cabinet containing the battery Breakers, and the right side panel in the next Battery Cubicle. Line up the two cabinets, ground the two together with the enclosed green cable and hardware. Repeat this if more cabinets have to be connected.

The cable connections can be made via the Gland Plates in the Battery Cabinet and in the UPS. Please refer to Section 1.7 in the guide for cable dimensions, and Section 1.9 for information about cable connections.

Information about position of the terminals can be found in Section 1.8 of this guide, and in the APC Silcon Installation Guide for the UPS.

## 1.7 Fusing - and Cable size

System	Battery MCCB	DC Conductors per Battery Pole
15kW, 208V	100A	2 awg
20kW, 208V	100A	2 awg
30kW, 208V	125A	1/0 awg
40kW, 208V	125A	1/0 awg
60kW, 208V	200A	4/0 awg
80kW, 208V	200A	350 awg
30kW, 480V	100A	2 awg
40kW, 480V	100A	2 awg
60kW, 480V	100A	2 awg
80kW, 480V	125A	1/0 awg

- Cable sizes refer to US National Electric Code, Table 310-16, Copper material, cables rated 75°C/167°F at max. 40°C/104°F ambient in conjunction with "Notes to Ampacity Tables of 0 to 2000 Volts" point 8.
- Use commercially available UL listed solderless lugs for the wire size required for our system. Connect wire to the lug using tools and procedures specified by the lug manufacturer.

### NOTICE!

All external cable dimensions are recommended.  
Please refer to local legal provisions.

## Battery Cabinet

### NOTICE!



"phase".



"risk of electric shock".



Terminal for Equipment Grounding Conductor is marked

"E"

Terminal for Grounding Electrode Conductor

### NOTICE!

The terminals marked  and  are electrically connected to the terminal marked "E".

### NOTICE!

Grounding, please refer to local legal provisions.

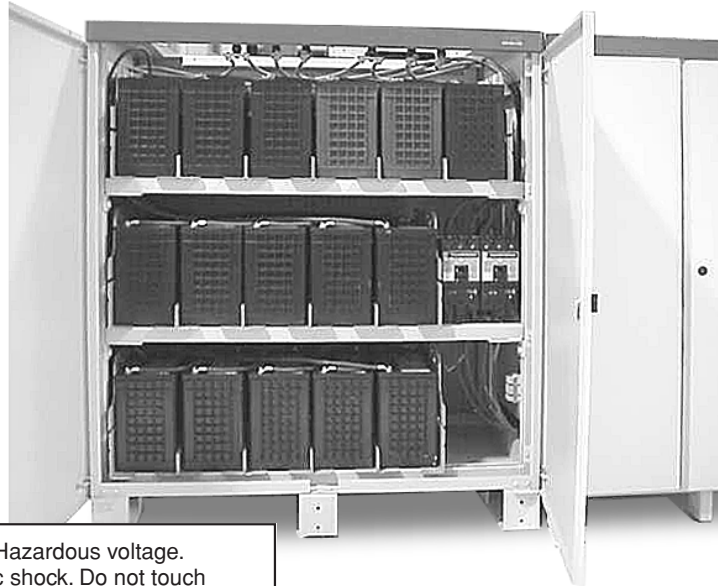
**WARNING:** For continued protection against risk of fire, replace only with the same type and rating of fuse.

885-4370

# Battery Cabinet

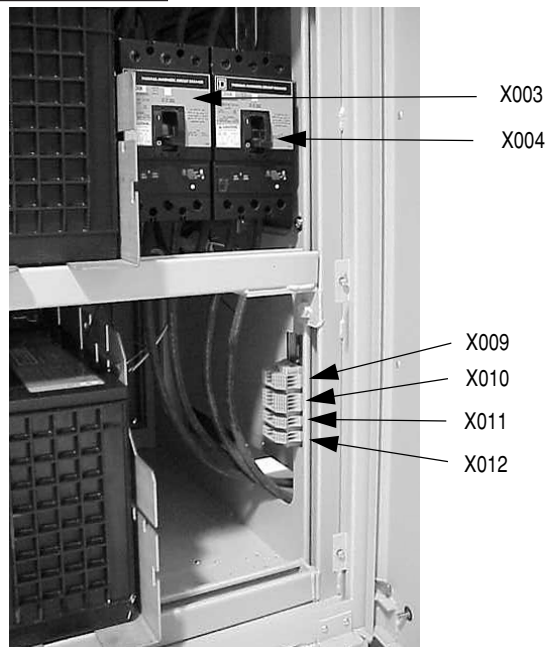
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## 1.8 Terminals



**DANGER:** Hazardous voltage.  
Risk of electric shock. Do not touch  
uninsulated battery terminal.

885-4367

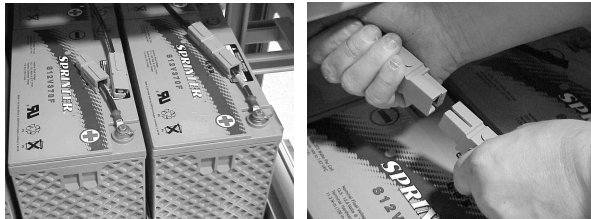


Cable connections from UPS

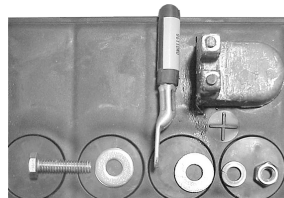
# Battery Cabinet

## 1.9 Connecting

In order to prevent short circuits during transportation, several cables have been disconnected. These cables must be reconnected before the battery cabinet is connected to the UPS. The cable connections that need to be made are joined to their mating connector during shipping. Detach mating half and plug in as shown below.



Below the proper hardware sequence is illustrated.



The label on top of the battery and front of the circuit breaker indicates torque recommendations for all connections. (Di-electric compound applied to terminals).

### **NOTICE!**

Ensure that battery breakers are in "off" position before mounting cables.

### **NOTICE!**

For operation of Battery Breakers, please refer to UPS Installation Guide.

### 1.9.1 Before Starting Up



#### **WARNING!**

1. Ensure that no electric power supply source has been connected to the APC Silcon UPS for at least 5 minutes.
2. Ensure that breakers in the battery cabinet are in "off" position.

### 1.9.2 Connecting the APC Silcon Battery Cabinet and the APC Silcon UPS

Please refer to the APC Silcon Installation Guide for cable dimensions. The following procedure is recommended for connection of batteries:

1. Connect the UPS terminals X004 and X012 on the System Integration Interface- board to the terminals X009, X010 and X012 in the battery cabinet by means of the wires marked 150 to 158. These wires must be separated from the power cables. Refer to Section 1.10. Example Diagram.

# Battery Cabinet

- 2. If using a shunt trip (Emergency Power Off) connect wiring to terminal X011 in the battery cabinet. Refer to Section 1.10. Example Diagram.
- 3. Connect the UPS terminals PE, X003, and X004 to the corresponding terminals on the circuit breaker. Refer to Section 1.10. Example Diagram.
- 4. Mount top and front cover. Connect earth conductor.

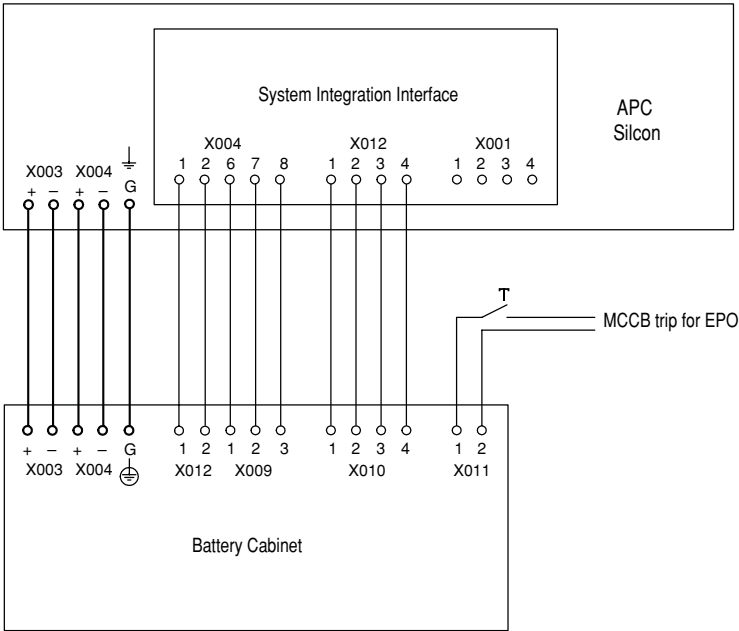


**WARNING!**

- 1. Follow the UPS start-up procedure described in the APC Silcon Installation Guide.
- 2. To avoid damaging the system do not close battery breaker until display shows:  
**INSERT FUSE OR CLOSE MCB.**
- 3. Make sure 2 LEDs on the MCCB Cabinet are lit up.

- 5. It is recommended that a battery capacity test is performed after the installation is completed.

### 1.10 Example Diagram: APC Silcon UPS with battery cabinet



**NOTICE!**

After starting up the system,check that the battery temperature can be displayed by pressing 5 & 8 simultaneously on the UPS display. If not correctly installed/configured the display will show: NV (Not Valid)

<p>CAUTION- RISK OF ELECTRIC SHOCK HARZARDOUS LIVE PARTS INSIDE THIS UNIT ARE ENERGIZED FROM THE BATTERY SUPPLY EVEN WHEN THE EQUITMENT IS SWITCHED OFF.</p> <p>Battery disconnect</p>	<p>CAUTION - RISK OF ELECTRIC SHOCK OR ELECTRIC ENERGY-HIGH CURRENT LEVELS. DANGEROUS ELECTRIC CHARGE MAY BE STORED IN ASSOCIATED CIRCUITRY. DO NOT REMOVE COVER UNTIL 5 MINUTES AFTER DISCONNECTING ALL SOURCES OF SUPPLY. TEST BEFORE TOUCHING.</p>	<p>CAUTION - RISK OF ELECTRIC SHOCK</p> <p>THIS UNIT RECEIVES POWER FROM MORE THAN ONE SOURCE - DISCONNECTION OF ALL AC SOURCES AND DC SOURCES IS REQUIRED TO DE-ENERGIZE THIS UNIT BEFORE SERVICING.</p>
--	---	---

## 1.11 Parallel Connection

Parallel connection of battery cabinets extends the back-up time.

When paralleling battery cabinets the battery breaker shunt trip cabinet has to be installed next to the UPS. All other cabinets will not contain a battery breaker. The maximum number of battery strings to be paralleled is 4.

The “add-on” cabinets are labeled: 1st string positive, 1st string negative, 2nd string positive and 2nd string negative. The interconnecting wires on the next cabinet are labeled the same way. Connect the “add-on” battery cabinet to the main cabinet.

## How to contact APC

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### 2.0 How to contact APC



For more information call:

Tel: (800) 800-4APC - US & Canada  
Tel: (401) 789-0204 - Worldwide

**APC Corporate**

132 Fairgrounds Road  
West Kingston, RI 02892  
USA  
Tel: (401)789-0204  
Fax: (401)789-3710  
Internet: [apcinfo@apc.com](mailto:apcinfo@apc.com)  
PowerFax™: (800) 347 - FAXX  
APC Web site: [www.apcc.com](http://www.apcc.com)

**APC Denmark**

Silcon Allé  
DK-6000 Kolding  
Tel: (+45) 75 54 22 55  
Fax: (+45) 72 19 03 50

**Pre-sales Technical Support**

1-877-474-5266 (1-877-4Silcon)

**Post-sales Technical Support**

1-877-287-7835 (1-877-2UPS-TEK)

Fax: 1-401-438-7761

Web: [www.apcc.com/support/contact/contact\\_support.cfm](http://www.apcc.com/support/contact/contact_support.cfm)



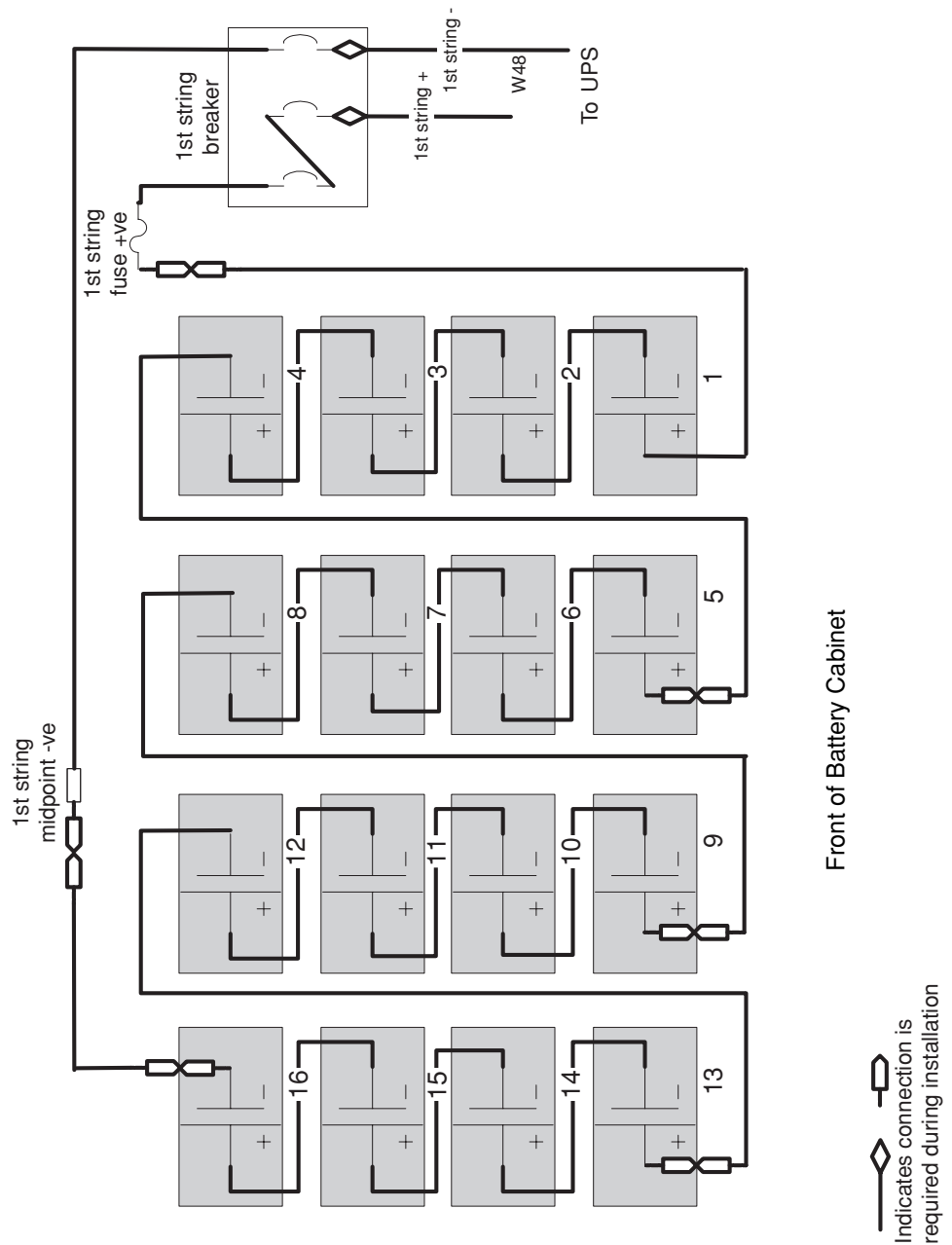
## 3.0 Appendix

### 3.1 Battery Cabinet Style Definitions

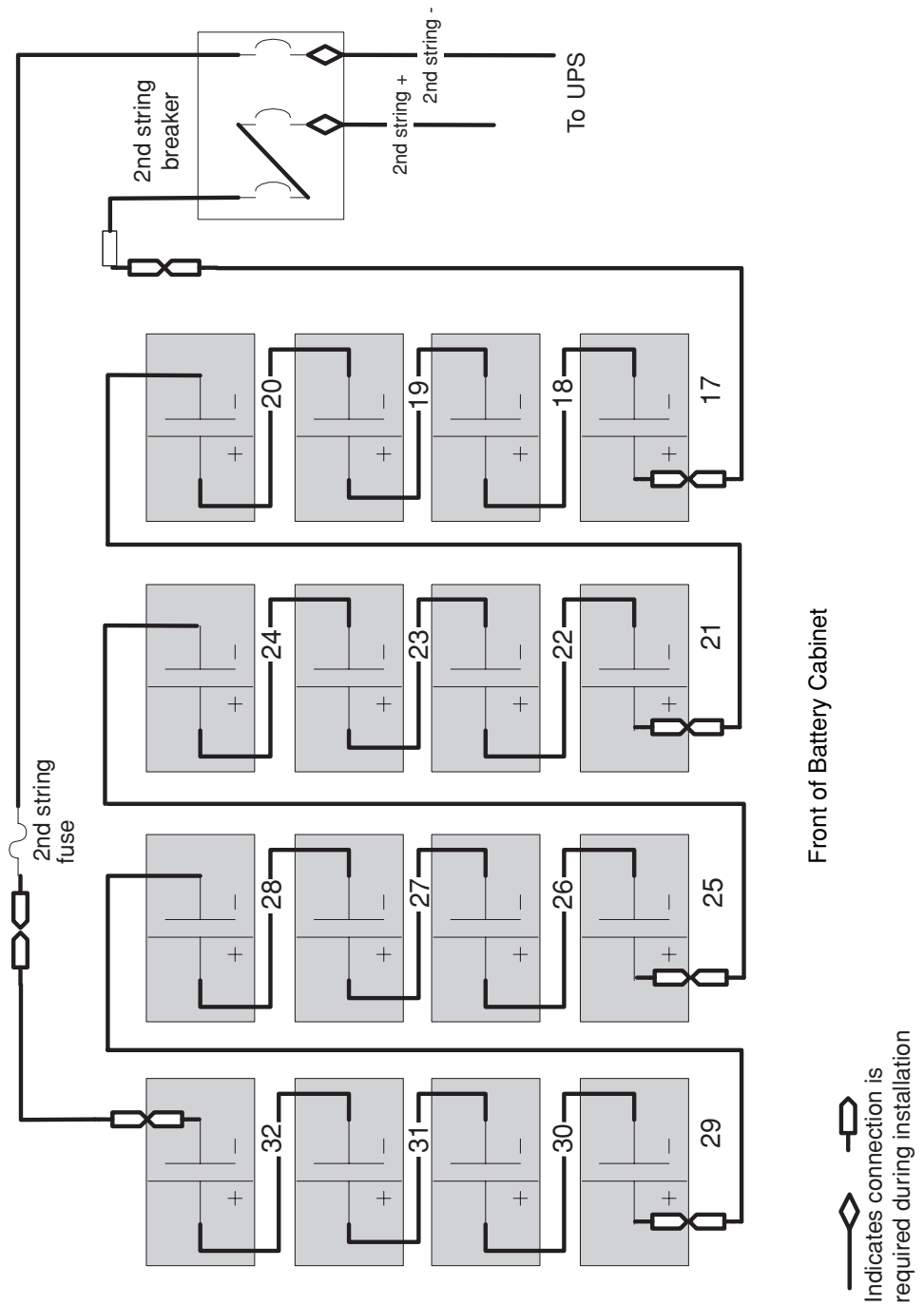
Style	Voltage	Cabinet Dimensions	Number of Batteries per Top Shelf	# of Batteries	# of Cabinets	Battery Cabinet
A	192vdc	W=50", H=55", D=31.5"	16	32	1	10-80kW
B1	192vdc	W=50", H=55", D=31.5"	12	32	1	10-80kW
B1XR	192vdc	W=50", H=55", D=31.5"	12	32	1	10-80kW
B3	384vdc	W=50", H=55", D=31.5"	12	64	2	10-80kW
B4	192vdc	W=50", H=55", D=31.5"	8	32	1	10-80kW
C2	384vdc	W=50", H=55", D=31.5"	25	64	1	10-80kW
C2XR	384vdc	W=50", H=55", D=31.5"	25	64	1	10-80kW
C3	384vdc	W=50", H=55", D=31.5"	8	64	2	10-80kW

# Appendix

## 3.1.1 Battery Layout Drawing Style A, Middle Shelf

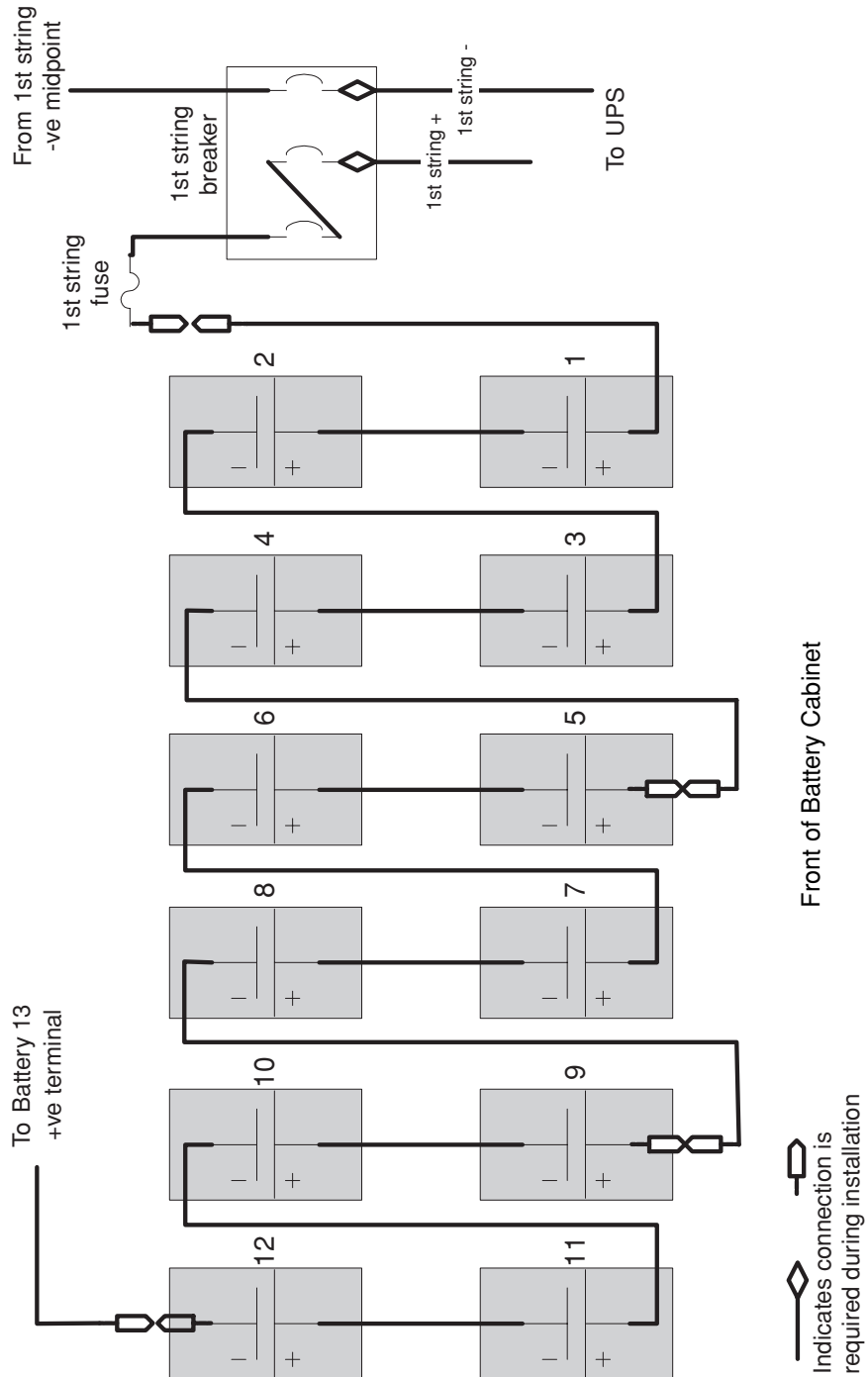


## 3.1.2 Battery Layout Drawing, Style A, Bottom Shelf

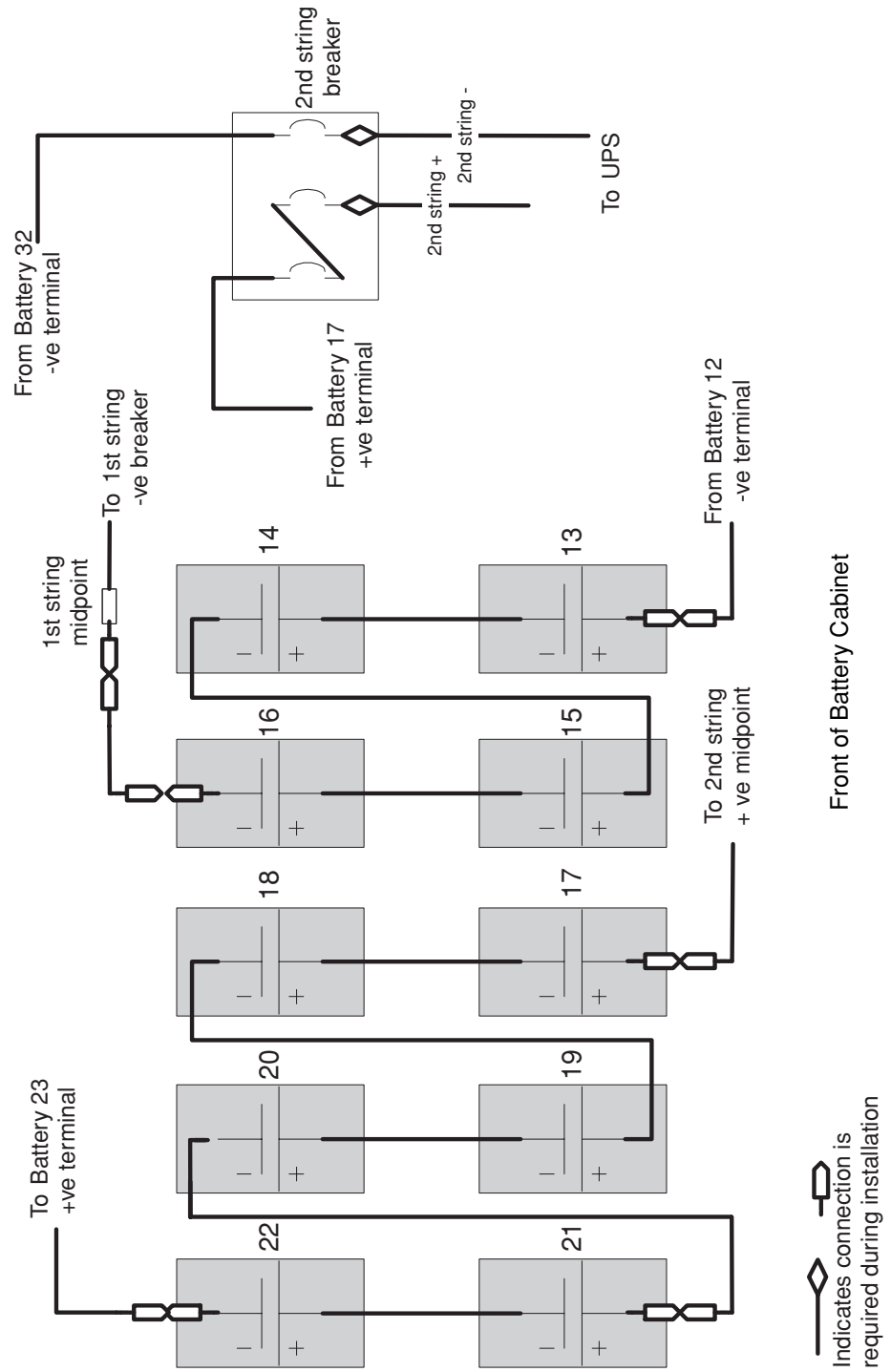


# Appendix

## 3.1.3 Battery Layout Drawing, Style B1, Top Shelf

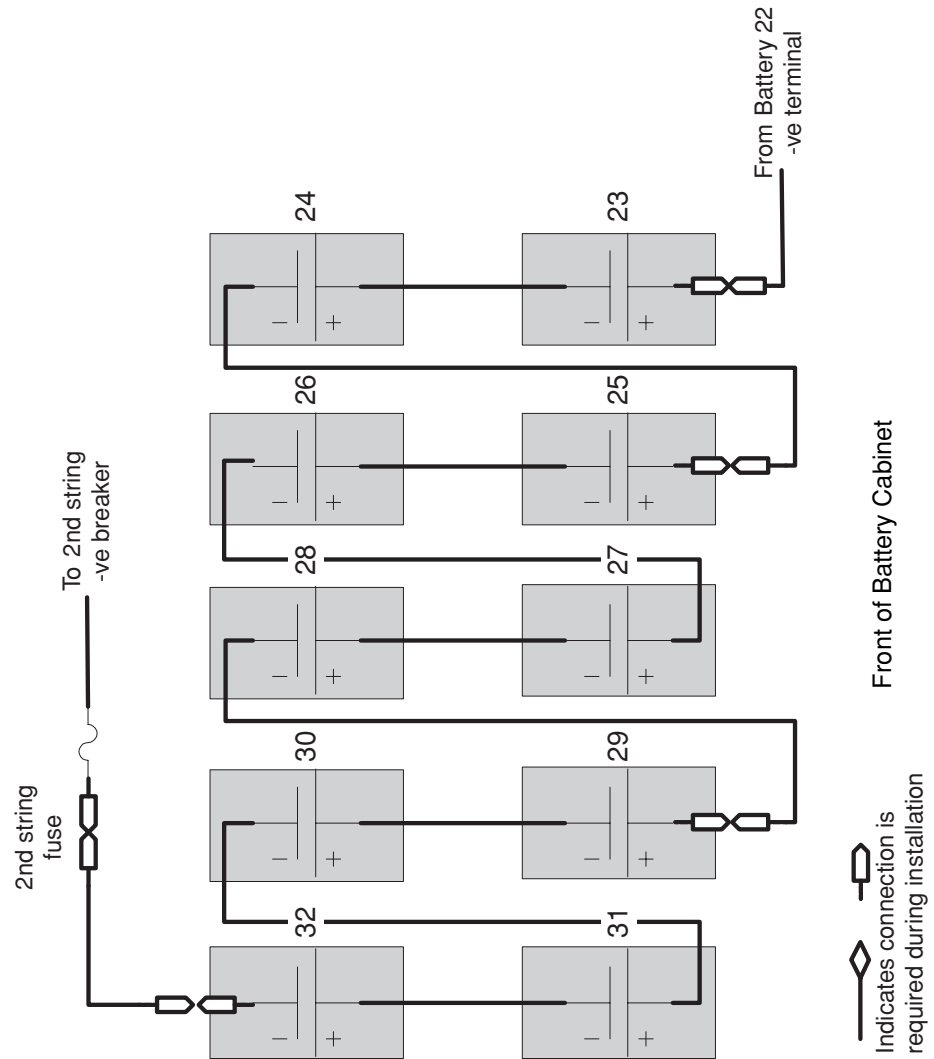


## 3.1.4 Battery Layout Drawing, Style B1, Middle Shelf

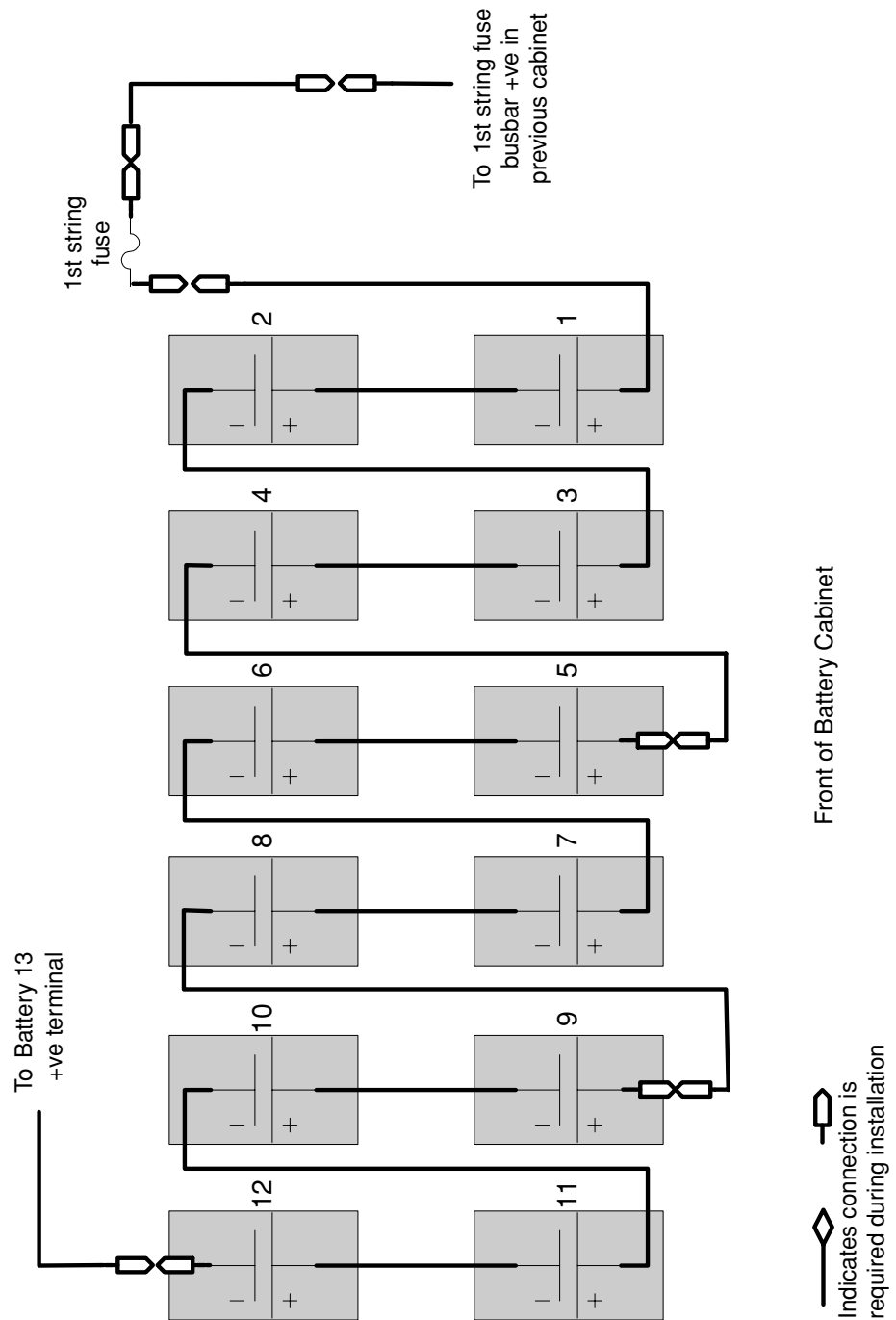


# Appendix

## 3.1.5 Battery Layout Drawing, Style B1, Bottom Shelf

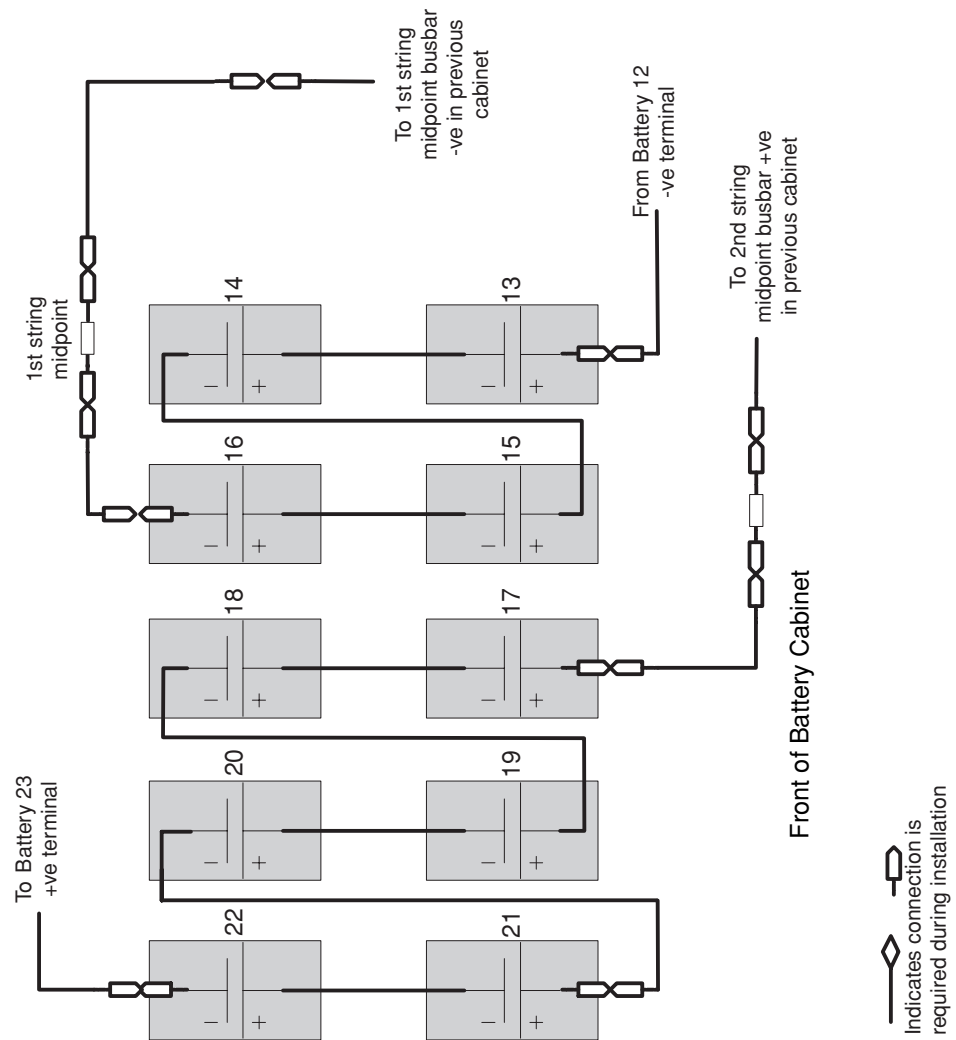


## 3.1.6 Battery Layout Drawing, Style B1XR, Top Shelf



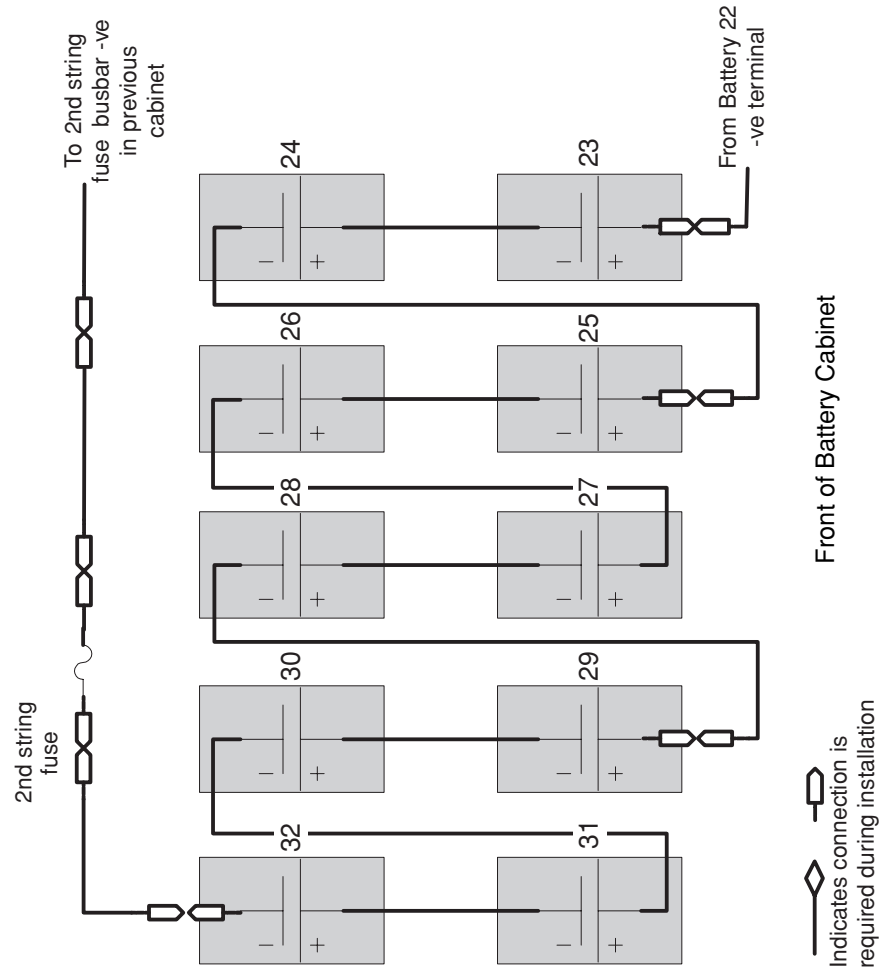
# Appendix

## 3.1.7 Battery Layout Drawing, Style B1XR, Middle Shelf



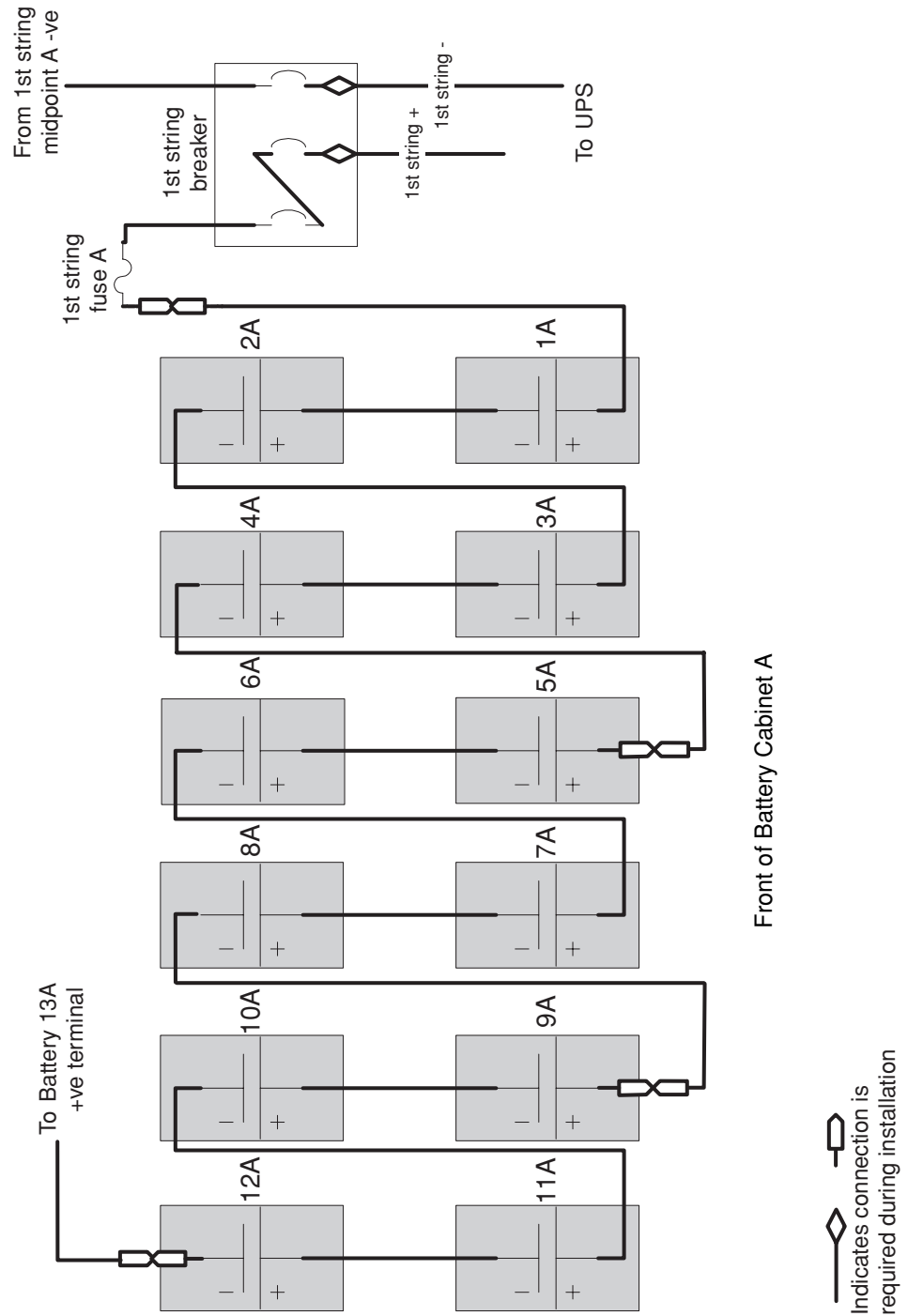


## 3.1.8 Battery Layout Drawing, Style B1XR, Bottom Shelf



# Appendix

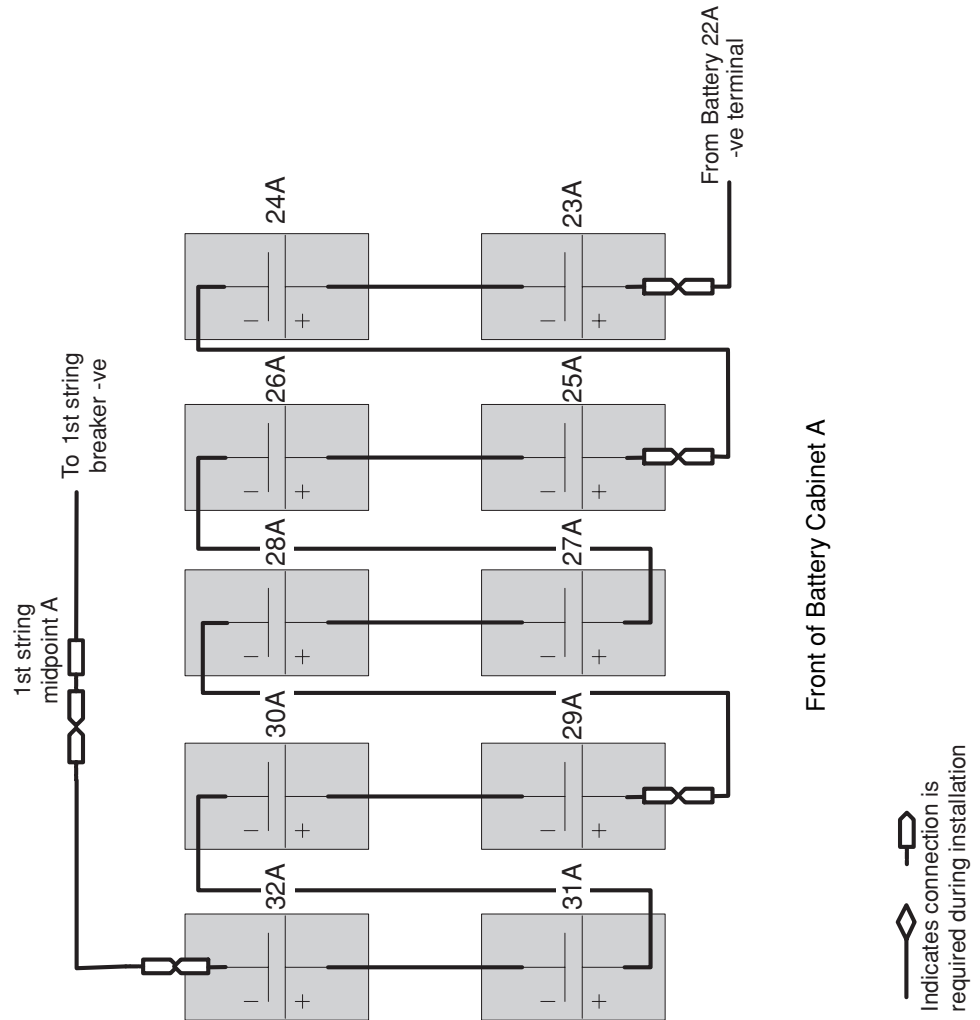
## 3.1.9 Battery Layout Drawing, Style B3, Battery Cabinet A, Top Shelf



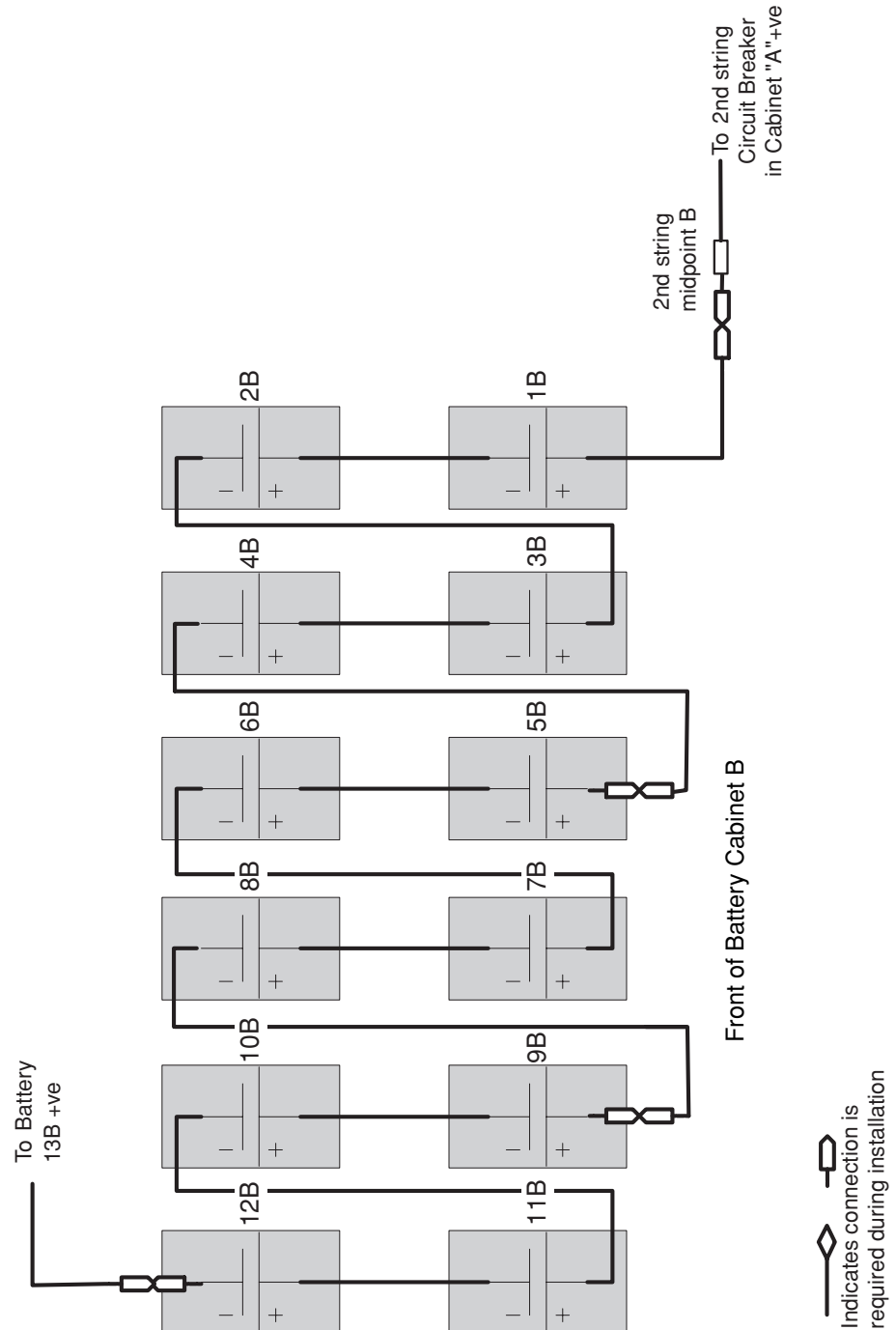


## Appendix

### 3.1.11 Battery Layout Drawing, Style B3, Battery Cabinet A, Bottom Shelf

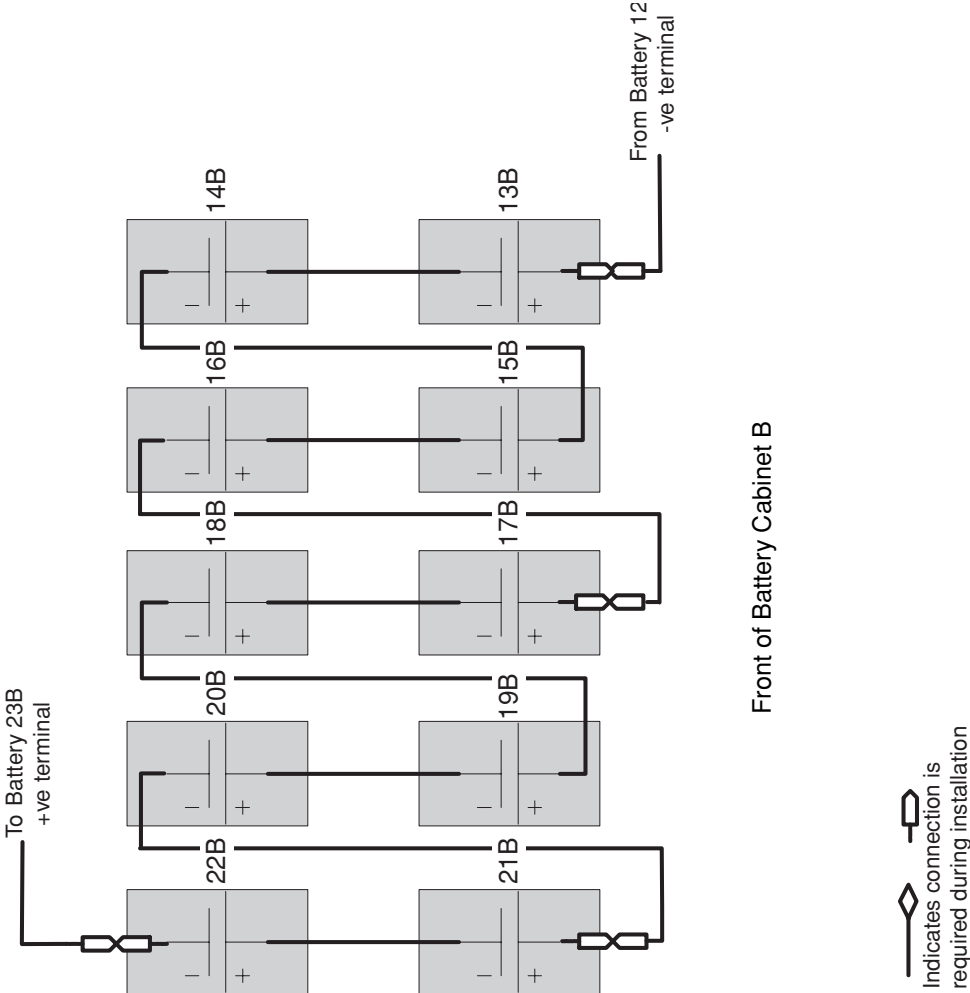


## 3.1.12 Battery Layout Drawing, Style B3, Battery Cabinet B, Top Shelf

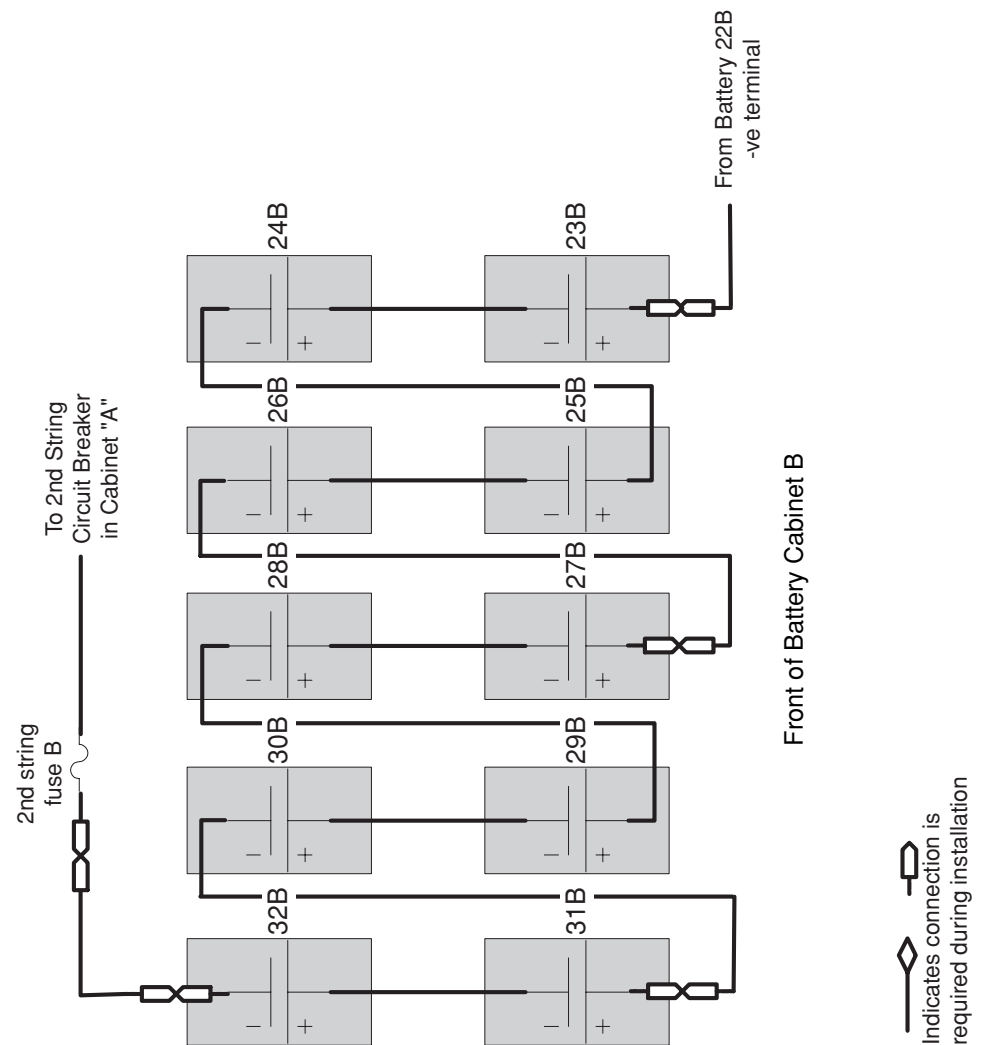


# Appendix

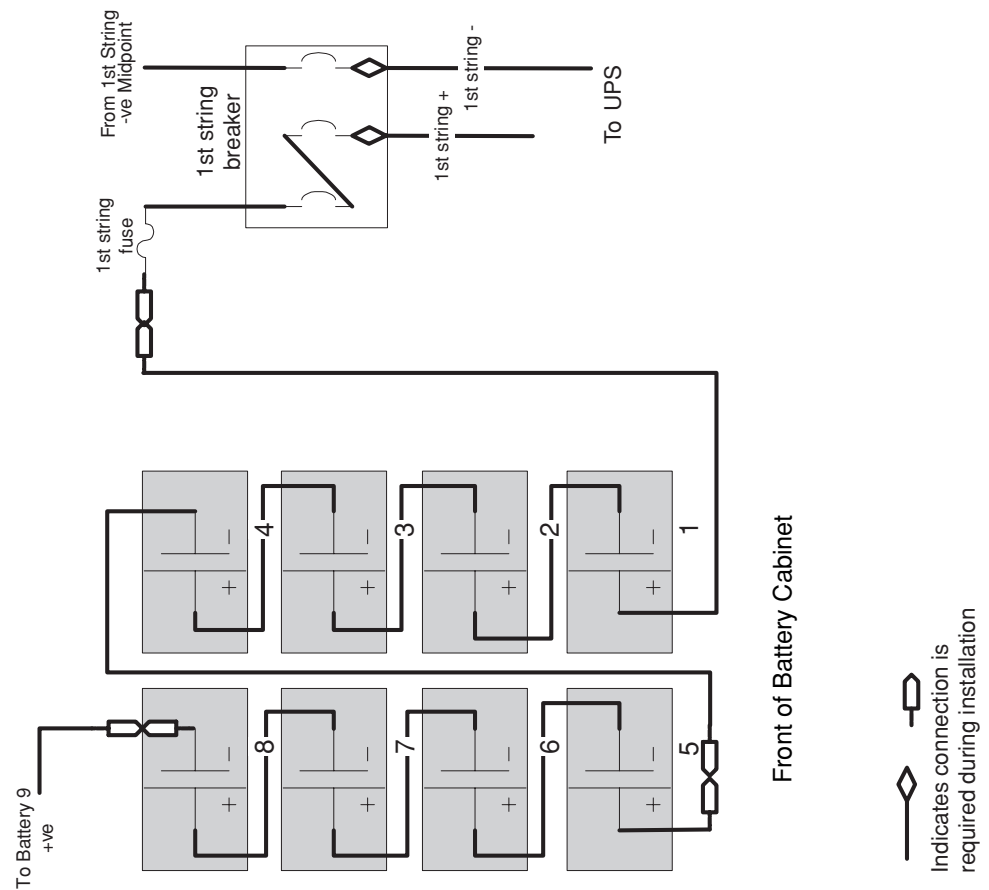
## 3.1.13 Battery Layout Drawing, Style B3, Battery Cabinet B, Middle Shelf



## 3.1.14 Battery Layout Drawing, Style B3, Battery Cabinet B, Bottom Shelf

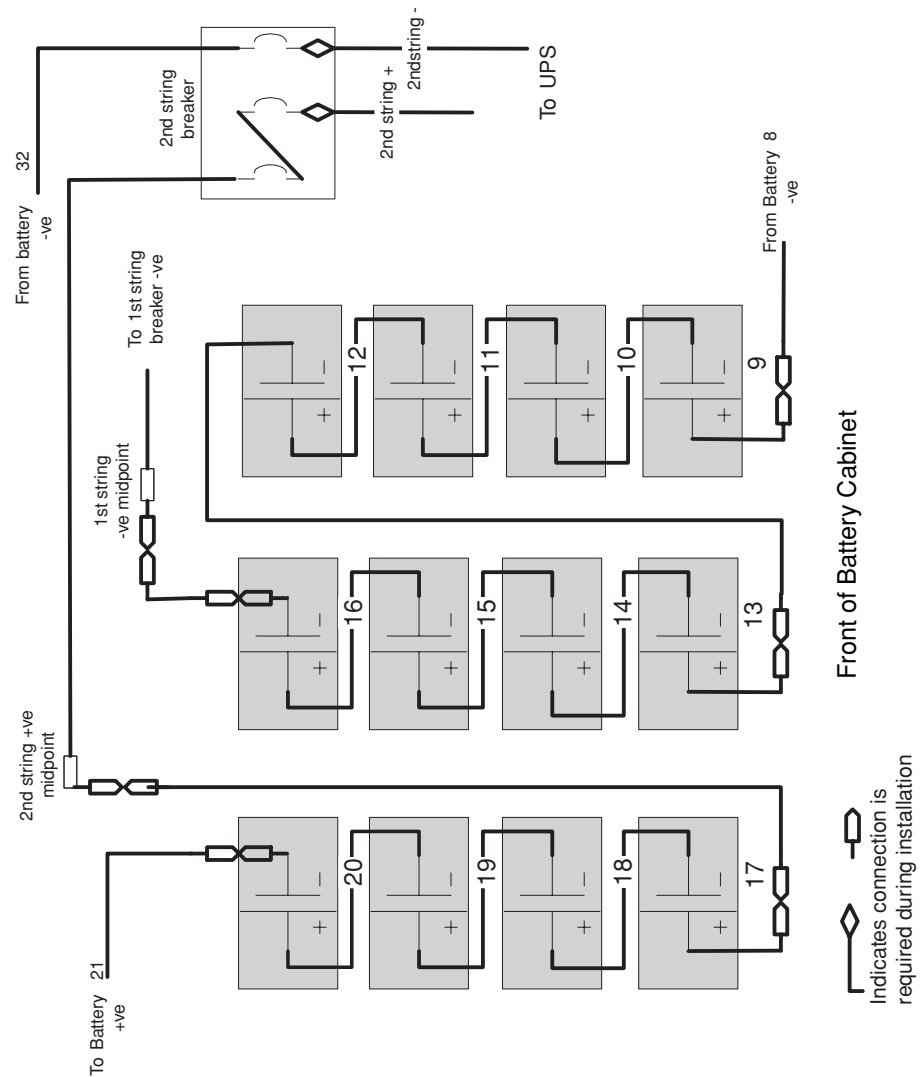


### 3.1.15 Battery layout Drawing, Style B4, Top Shelf



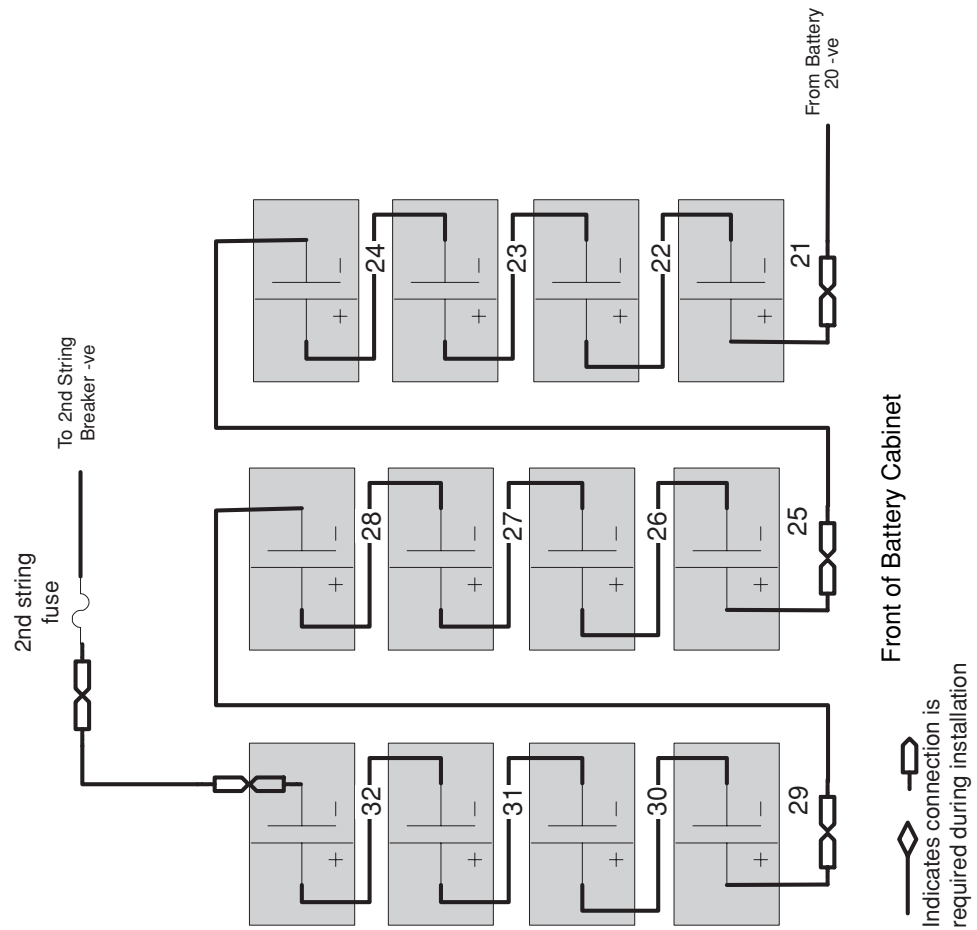


## 3.1.16 Battery Layout Drawing, Style B4, Middle Shelf

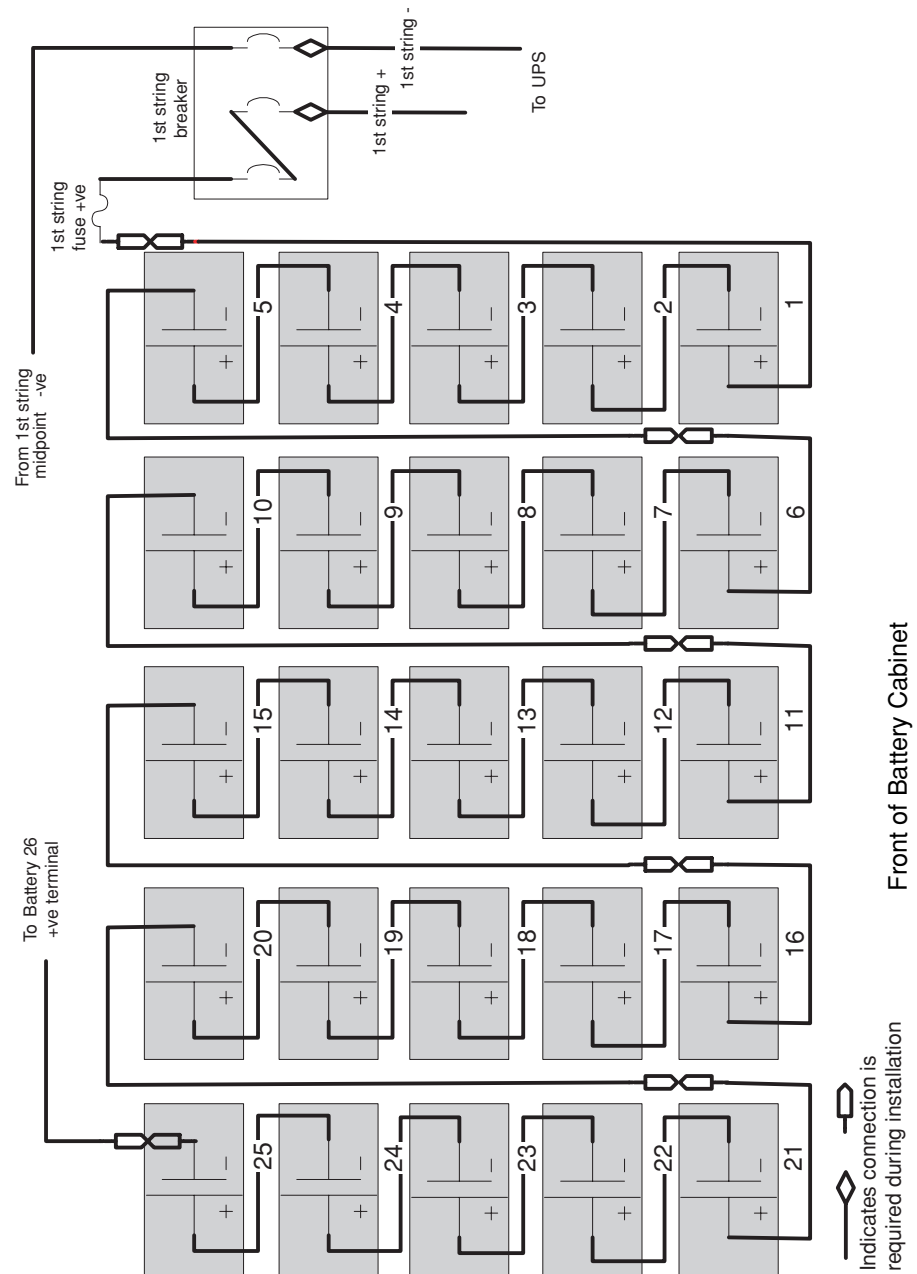


# Appendix

## 3.1.17 Battery Layout Drawing, Style B4, Bottom Shelf

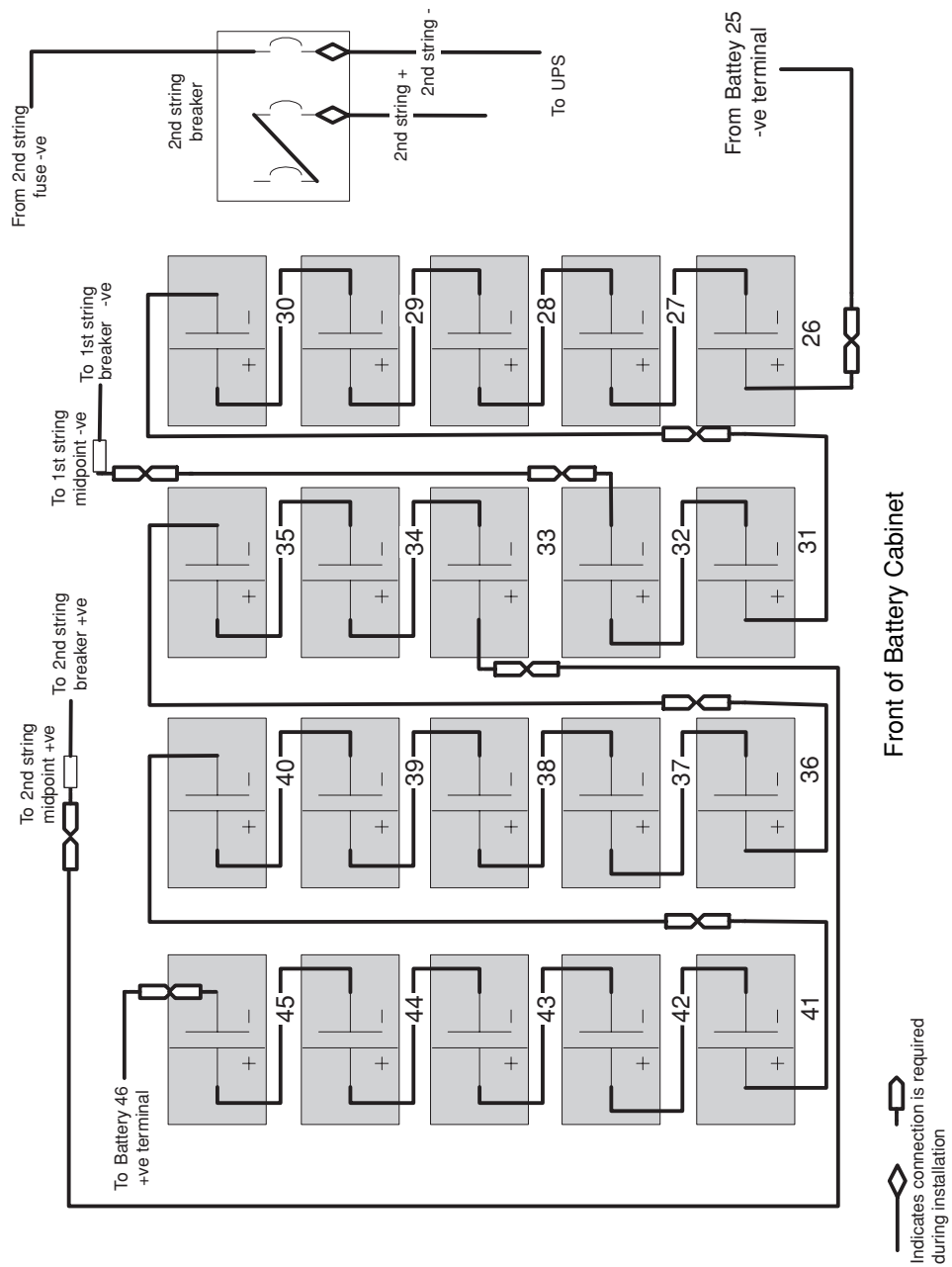


## 3.1.18 Battery Layout Drawing, Style C2, Top Shelf

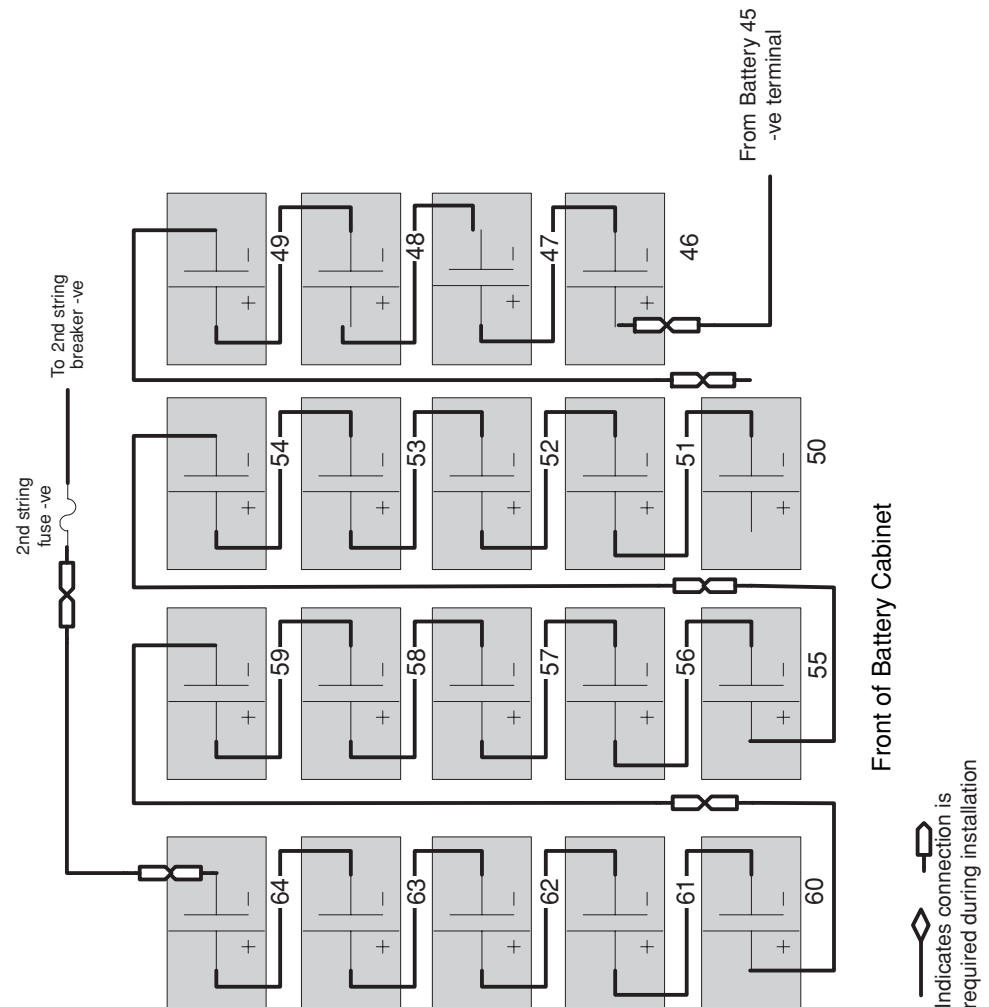


# Appendix

## 3.1.19 Battery Layout Drawing, Style C2, Middle Shelf

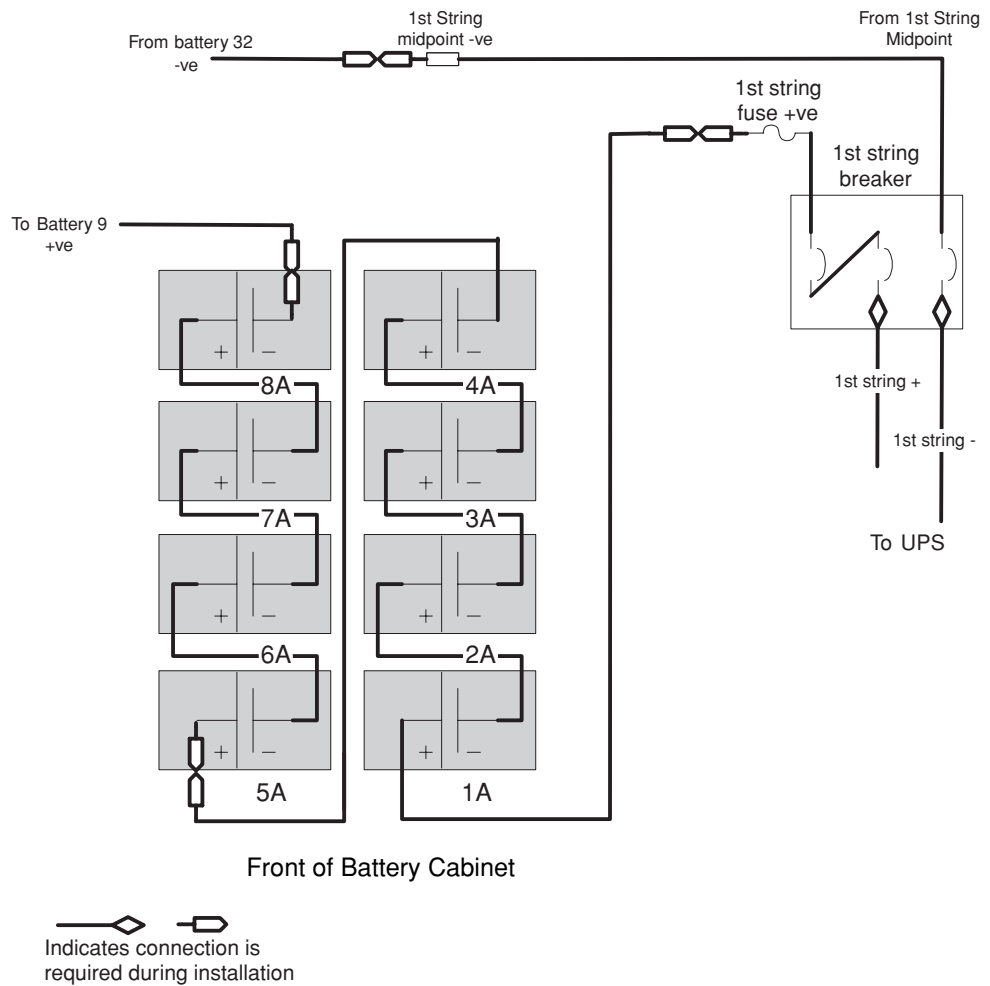


## 3.1.20 Battery Layout Drawing, Style C2, Bottom Shelf

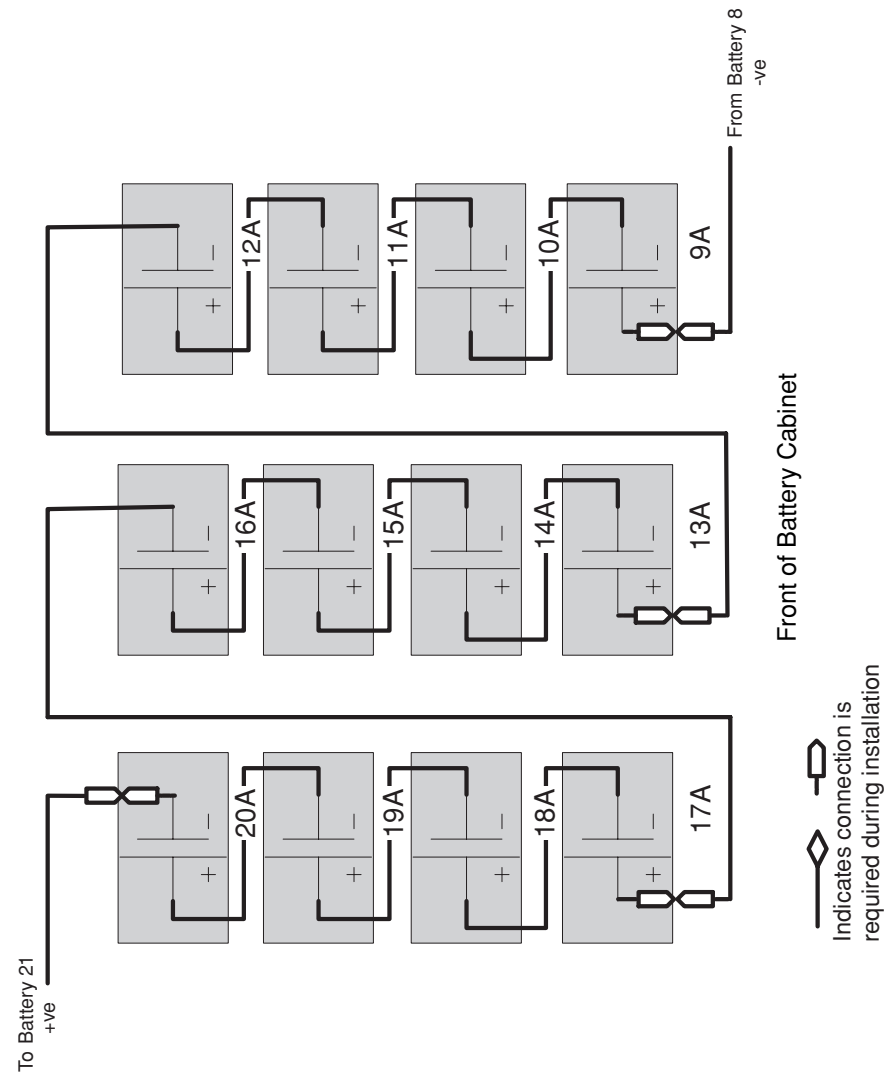


## Appendix

### 3.1.21 Battery Layout Drawing, Style C3, Top Shelf, Cabinet A

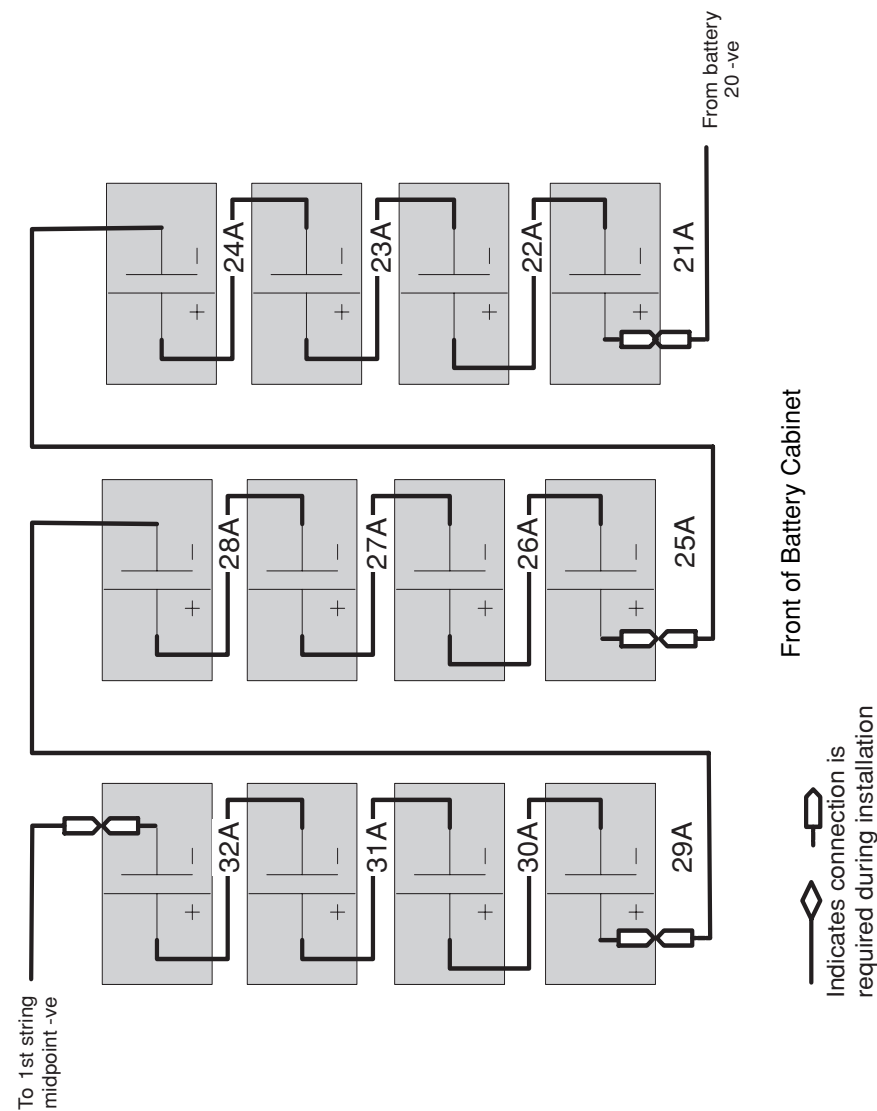


## 3.1.22 Battery Layout Drawing, Style C3, Middle Shelf Cabinet A



# Appendix

3.1.23 Battery Layout Drawing, Style C3, Bottom Shelf, Cabinet A

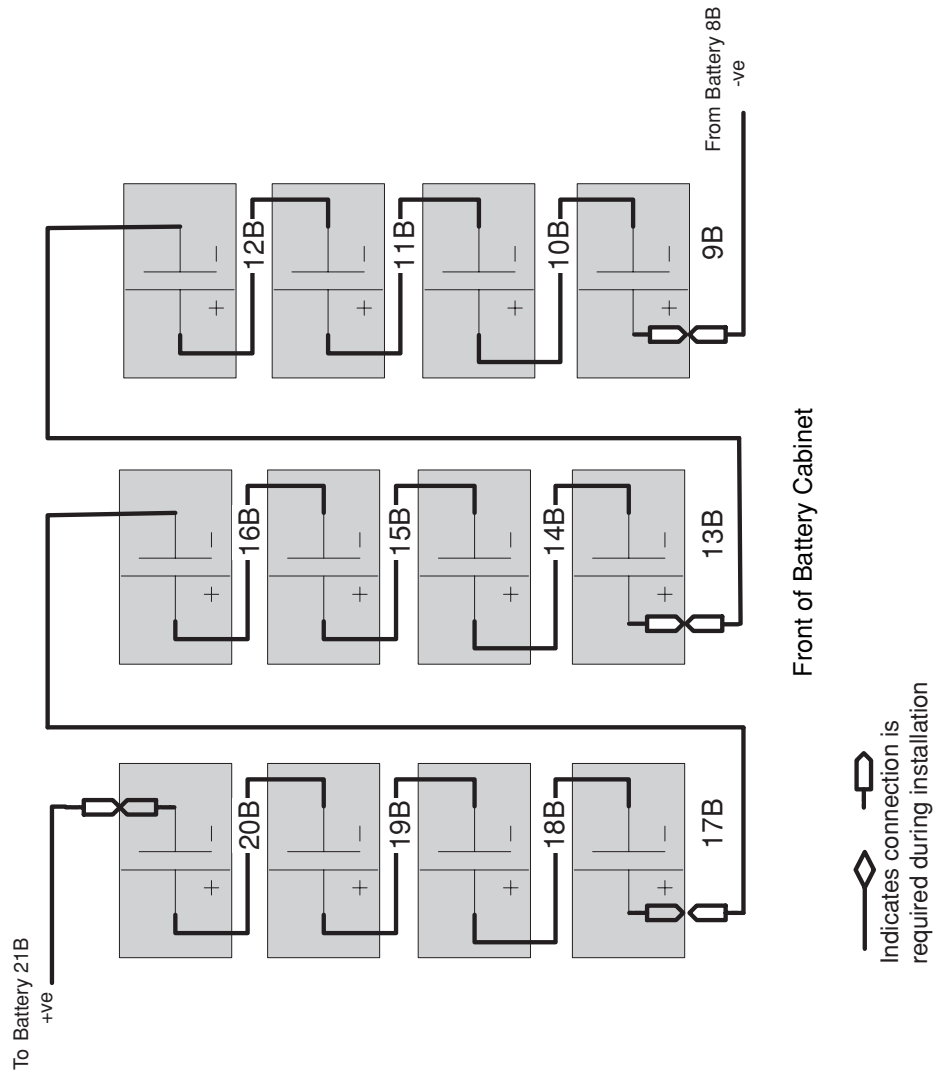




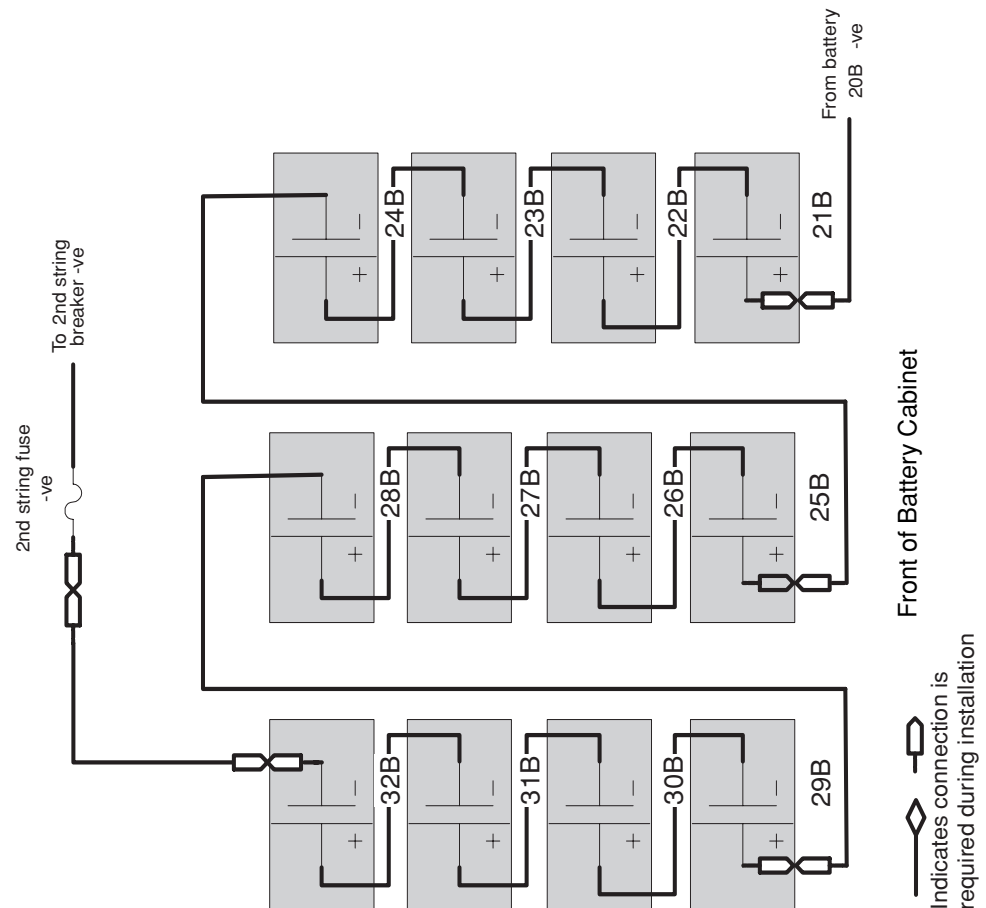


# Appendix

## 3.1.25 Battery Layout Drawing, Style C3, Middle Shelf Cabinet B

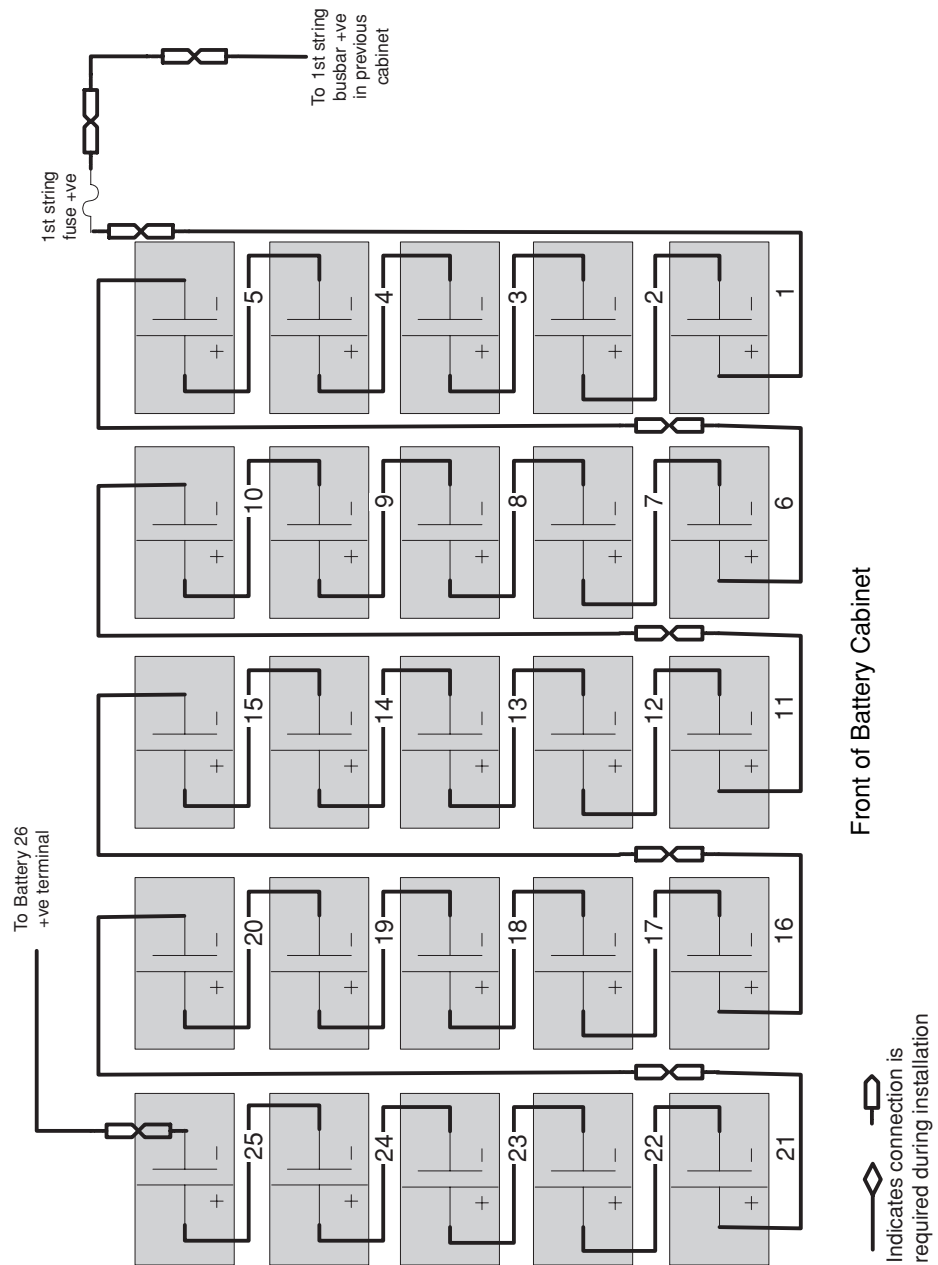


## 3.1.26 Battery Layout Drawing, Style C3, Bottom Shelf Cabinet B



# Appendix

## 3.1.27 Battery Layout Drawing, Style C2XR, Top Shelf



## 3.1.28 Battery Layout Drawing, Style C2XR, Middle Shelf



# Appendix

## 3.1.29 Battery Layout Drawing, Style C2XR, Bottom Shelf

